

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2 and 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Taniguchi et al (US Patent No. 6,331,248 B1).

Regarding claims 1-2, Taniguchi et al teach a hollow fiber membrane cartridge, having two or more hollow fiber membrane bundles each comprising a plurality of hollow fiber membranes and having opposite ends fixedly bonded by an adhesion fixation layer, a cartridge head fixed to an outer periphery of one end of the hollow fiber membrane bundles in a liquid tight manner, and a lower ring fixed to an outer periphery of the other end of the hollow fiber membrane bundles, wherein a hollow portion of each of the hollow fiber membranes is opened at the cartridge head-side end (5) of the cartridge, the hollow portion of the hollow fiber membrane is sealed in a lower ring-side adhesion fixation layer (5'), and a plurality of through-holes (6) are formed in the lower ring-side adhesion fixation layer (5'), and wherein the through-holes (6) are arranged in the hollow fiber membrane bundle, an end of the lower ring (1, 2) projects from an end surface of the lower ring-side adhesion fixation layer (5'), and at least part of the hollow fiber membrane bundles are divided into at least two, plural small bundles in the cartridge head-side adhesion fixation layer.

Regarding claims 4-5, Taniguchi et al shows bundles arranged on one or more concentric circles and in all directions from a central portion to outer peripheral portions (see figures 9, 11, 13, 15).

Regarding claim 6, Taniguchi et al teaches that resin used in the bonding portion or fixation layer has JIS-A hardness of at least 30 (see col. 9, lines 40-48).

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. Taniguchi et al teach the hollow fiber membrane cartridge as described in above paragraph 2. Claim 3 essentially differs from the cartridge of Taniguchi et al in reciting claimed distance between the hollow fiber membranes located closest to each other, claimed number of hollow fiber membranes and claimed distance between the small bundles located closest to each other. Taniguchi et al teach that number of openings of hollow fiber bundles are varied depending on the diameter of module and the shape of openings (see col. 12, line 53 – col. 13, line 8). It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the claimed parameters, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

5. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al as applied to claims 1-6 above, and further in view of Behmann et al (US Patent No. 6,620,319). Taniguchi et al teach the hollow fiber membrane cartridge as described in above paragraph 2. Taniguchi et al teach the use of the cartridge for filtration and back wash reverse filtration using gas (see col. 14, lines 33-65). Claim 3 essentially differs from the cartridge of

Taniguchi et al in reciting placing the cartridge in a vertical container. Mahendran et al teach the use of hollow fiber membrane cartridge placed in a vertical container to aerate the membranes with gas under the membrane (see abstract; figures 4, 6, 10, 12). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the cartridge of Taniguchi et al placed in a vertical container to treat raw water even sewage as it is well-known in the art.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN KIM whose telephone number is (571)272-1142. The examiner can normally be reached on Monday-Friday 7 a.m. - 3:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John Kim/
Primary Examiner, Art Unit 1797

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